

ABSTRACT

The present invention provides a novel carbon-based material in which carbons different in property are combined in such a manner as to be applicable to a device. The carbon-based thin film provides a carbon-based thin film including first phases 1 that contain amorphous carbon and extend in a film thickness direction, and a second phase 2 that contains a graphite structure and intervenes between the first phases 1. In the thin film, at least one selected from the group consisting of the following a) to e) is satisfied: a) the second phase contains more graphite structures per unit volume than the first phases; b) a density of the second phase is larger than that of the first phases; c) an electric resistivity of the second phase is lower than that of the first phases; d) an elastic modulus of the second phase is higher than that of the first phases; and e) in the second phase, a basal plane of the graphite structure is oriented along the film thickness direction.